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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/873,059	06/02/2001	Kenneth R. Philpot	50002.2006	3958

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EXAMINER

THAI, LUAN C

ART UNIT PAPER NUMBER

2827

DATE MAILED: 09/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/873,059	PHILPOT, KENNETH R.	
	Examiner	Art Unit	
	Luan Thai	2827	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 21-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>9</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office action is responsive to the amendment filed April 15, 1999.

Claims **1-23** are pending in this application.

Claims **21-23** have been withdrawn from consideration as being directed to a non-elected invention.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims **1-20** are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification, as originally filed, does not clearly describe the conductive leads (e.g., how the conductive leads' lengths are to minimize the series inductance of the device package) to enable any person skilled in the art to make and use the same.

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims **1-20** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In independent claims **1 and 14**, the newly added limitations "a plurality of conductive leads with lengths such that the series inductance of the device package is minimized" and "said encapsulant material having a composition such that the parasitic capacitance of the device package is minimized" are unclear as how the structure of the device package is (e.g., the lengths of the conductive leads and the composition of the encapsulant material) to minimize the series inductance of the device package and the parasitic capacitance of the device package, respectively, as recited in independent claims **1 and 14**. The examiner assumes that a device package having a similar structure with the claimed structure device would inherently have the series inductance and the parasitic capacitance minimized.

Claims **2-13 and 15-20** are rejected since each includes the limitations of independent claims **1 and 14**.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claims 14 and 17, insofar as in compliance with 35 USC § 112, are rejected under 35 U.S.C. 102(e) as being anticipated by Kobayashi et al. (6,350,631 of record).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 14 and 17, Kobayashi et al. disclose (see specifically figures 1) a surface-mount semiconductor device package comprising: a planar ceramic substrate 32 having a first surface (e.g., top surface) and an opposing second surface (e.g., bottom surface); a semiconductor device 14 disposed on the substrate first surface; conductive pads 21-24 disposed on the substrate second surface; conductive leads 11-13 coupling the semiconductor device (directly and via wires 15-16) to the conductive pads 21-24, respectively; an epoxy resin 25, having low dielectric constant, encapsulating the semiconductor device 14 and the substrate first surface.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-7, 10-11, and 18, insofar as in compliance with 35 USC § 112, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (6,350,631 of record) in view of Hembree (6,117,797 of record).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 1, 5-7, 10-11, and 18, Kobayashi et al. disclose all the limitations of the claimed invention as detailed above except for the epoxy resin being Dexter FP4451 epoxy resin.

Dexter FP4451 epoxy resin, however, is conventionally used in the art as an encapsulant material and available from the DEXTER ELECTRONIC MATERIALS DIVISION OF DEXTER CORPORATION, etc. as disclosed by Hembree (Col. 6, lines 60+). It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the well known Dexter FP4451 epoxy resin, as taught by Hembree, to Kobayashi et al.'s device package to encapsulate the semiconductor device and the substrate first surface, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. And the encapsulant, which is made of Dexter FP4451 epoxy resin, would obviously has thermal expansion properties substantially similar to the thermal expansion properties of the substrate, which is made of ceramic.

Regarding claims 2-4, since the proposed device package of Kobayashi et al. and Hembree and the claimed device package are similar (e.g., having the same material for forming the substrate and the encapsulant), the proposed

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package would obviously have the thermal resistance as being claimed (e.g., being less than approximately 25 degrees Centigrade per Watt).

6. Claims 8-9 and 15-16, insofar as in compliance with 35 USC § 112, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (6,350,631 of record) in view of Hembree (6,117,797 of record) and further in view of Graham et al. (5,296,074 of record).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 8-9 and 15-16, the proposed device package of Kobayashi et al. and Hembree discloses all the limitations of the claimed invention as detailed above except for the substrate comprising alumina (as recited in claims 8 and 15) or beryllia (as recited in claims 9 and 16).

Alumina and beryllia, however, are two well-known materials in the art for making a ceramic substrate, as disclosed by Graham et al (col. 5, lines 35+). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use alumina or beryllia for the device package of Kobayashi et al. and Hembree, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

7. Claims 12-13 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (6,350,631 of record) in view of Hembree (6,117,797 of record) and further in view of Hashizume (5,946,556 of record).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 12-13 and 19-20, the proposed device package of Kobayashi et al. and Hembree discloses all the limitations of the claimed invention as detailed above except for the semiconductor device being operable at frequencies within a range of about 2-20 GHZ (claims 12 and 19) or 10-12 GHZ (claims 13 and 20).

The device that is able to operate at frequencies within a range of about 2-20 GHZ or 10-12 GHZ, however, is conventional in the art, as disclosed by Hashizume (Col. 1, lines 15+), and it is well known within the skills of an artisan to choose the most suitable semiconductor device, depending on the application in hand.

8. The following reference(s) is/are cited as of interest to this application:

U.S. Pat. No. 6,392,294 to Yamaguchi (of record), U.S. Pat. No. 6,121,637 to Isokawa et al (of record), and U.S. Pat. No. 6,383,835 to Hata et al. (of record), are cited for showing the surface-mount semiconductor device package.

Conclusion

9. Applicant's arguments with respect to claims **1-20** have been fully considered, but they are deemed to be moot in view of the new grounds of rejection.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action because the newly added limitations (e.g., the underlined portions) in independent claims 1 and 14 raise new issues that would require further consideration and/or search. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan Thai whose telephone number is (703) 308-1211. The examiner can normally be reached on 6:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (703) 308-1233. The fax phone

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numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Luan Thai
September 20, 2003


EVAN PERT
PRIMARY EXAMINER